REMARKS

Claims 4-10, 12, 14-19, 22-28, 30, and 32-37 are pending in the present application. Claims 1-39 were presented for examination. Claims 1-3, 11, 13, 20, 21, 29, 31, 38, and 39, have been cancelled by amendment.

In the office action mailed May 23, 2005 (the "Office Action"), the Examiner rejected claims 2, 20, 21, and 23-29 under 35 U.S.C. 112, second paragraph. The Examiner further rejected claims 1-21 under 35 U.S.C. 101 in the Office Action. Claims 1-39 were also rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,578,005 to Lesaint *et al.* (the "Lesaint patent"), in view of U.S. Patent No. 5,615,121 to Babayev *et al.* (the "Babayev patent").

With respect to the rejection of claims 2, 20, 21, and 23-29, these claims have been cancelled by amendment, and consequently, the rejection of these claims under 35 U.S.C. 112, second paragraph, is now moot.

With respect to the rejection of claims 1-21 under 35 U.S.C. 101, claims 1-3 have been cancelled, and claim 4 has been amended to specifically recite a "computer-implemented method for finding an opening in which to fit an order in a schedule," so that the claimed method is expressly related to the technological arts. Consequently, the rejections of claims 1-21 under 35 U.S.C. 101 should be withdrawn.

As previously mentioned, claims 1-39 have been rejected by the Examiner under 35 U.S.C. 103(a) as being unpatentable over the Lesaint patent in view of the Babayev patent. Claims 4 and 22 are patentable over the Lesaint patent in view of the Babayev patent because the combined teachings of the Lesaint and Babayev patents do not teach or suggest the combination of limitations recited by the respective claims.

The Lesaint patent discloses a computer scheduling system for optimizing the allocation of a plurality of resources to a plurality of tasks in an environment where the availability of resources, and the tasks to be performed changes dynamically. The computer scheduling system executes a computer program having two main elements: an off-line tour construction programmed system illustrated generally in Figure 3 and an on-line real-time schedule modification system illustrated generally in Figure 4. *See* col. 9, lines 58-61. These two systems run independently, but the output of the off-line system is used as the starting point

for the operation of the on-line (real-time) system. Typically, both systems would be running at once, with the real-time system 40 controlling the current allocation of technicians to tasks while the schedule generation system 30, 31 prepares the data for the next run of the real-time system 40. *See* col. 9, line 61-col. 10, line 3.

Figure 3 of the Lesaint patent illustrates the general arrangement of the off-line system for generating the initial optimized schedule. The schedule generation system includes a deterministic pre-scheduler 30 and an optimizing subsystem 31. The system is operated using stable data, in order to prepare an initial provisional schedule which the real-time system 40 can then use as a basis for its own functioning as the situation develops. The initial optimized schedule can be prepared using a rigorous, but comparatively slow, process, because it does not have to react to changes in its data. For example, the initial optimized schedule may be prepared overnight, ready for the start of the working day. *See* col. 10, lines 4-13.

The function of the pre-scheduler 30 is to build up the fixed points in each technician's schedule, by scheduling as many as possible of the tasks it is given to satisfy the constraints it is given from a rule store 35. This will result in a "tour" of tasks for each technician. These tours are likely to be partial tours, that is, tours with some idle time, since the tasks scheduled by the pre-scheduler 30 are only a subset of all the tasks available. In addition the pre-scheduler 30 positions the "next available" time (normally the time that the technician is due to come on duty) breaks, scheduled absences, and the "end of day" event (the time that the technician is scheduled to go off duty) in each technician's tour. *See* col. 10, lines 26-37. The optimizing subsystem 31 generates a provisional schedule of allocations, by initially positioning further tasks around and between the fixed events (including the difficult-to-schedule tasks) established by the pre-scheduler 30, and then using a stochastic process to re-allocate these further tasks between the different technicians until an optimum schedule is achieved. *See* col. 10, lines 51-57.

The provisional schedule produced by the schedule generation system is then used to program the real-time modifier 40 illustrated in Figure 4, which is programmed to allocate tasks to technicians according to the provisional schedule, but is capable of departing from the provisional schedule if the real-time circumstances, as distinct from those predicted in the provisional schedule, require it. *See* col. 11, lines 3-9.

Figure 4 illustrates the principal features of the real-time modifier 40. A schedule status register 42, technician status register 43 and pool of work register 44 each provide an input to, and are in turn updatable by, an allocation processor 47. The registers 42, 43, 44 receive their initial data from the schedule store 32 and the pre-processors 33, 34 respectively. A parameter input 41 allows an operator to set various weightings and other values used by the system. *See* col. 11, lines 10-18. The modifier 40 is managed in such a way that changes which have come about since the schedules were generated can be taken into account at the earliest or most opportune moment. Such changes may be caused by technicians reporting in for new tasks earlier or later than expected, absences requested at short notice, changes to a scheduled task (e.g., an amended appointment), new tasks entering the system, or changes to the scheduling and allocation rules, such as a change to travel times to account for adverse weather or traffic conditions). The objective is to make sure that when a technician requests a task, the task actually allocated is the most suitable task available for that technician at the time the request for work is dealt with, whether or not it is the one originally scheduled. *See* col. 25, lines 21-33.

The Babayev patent is directed to a scheduler where requested tasks are provided sequentially and is required to respond in real time with a respective service interval for each requested task to be performed. When a new task is requested, the scheduler described in the Babayev patent dynamically rearranges the previously entered tasks to make efficient use of the resources available to perform all the tasks, and at the same time, satisfy time constraints that may be associated with each task. The scheduler retains information regarding time flexibility in performing the service request tasks, such as the estimated time required to perform the requested task and preferred times within which the task may be performed. If a new service request is requested for a time that overlaps an estimated time required to perform a previously entered task, and the previously entered task has sufficient flexibility, the previously entered task is moved to accommodate the new service request. As a result, a new schedule is generated in response to each new customer service request. Resources will be allocated within each of the various and previously specified time intervals when generating or attempting to generate a time interval to be provided to the customer requesting the new service request.

The combined teachings of the Lesaint and Babayev patents do not teach or fairly suggest the combination of limitations recited by claims 4 and 22. Claim 4 recites a computer-

implemented method for finding an opening in which to fit an order in a schedule including, among other things, examining a primary block, wherein the primary block is a candidate to fit the order if a duration of the primary block, excluding at least one break, is greater than or equal to the amount of free time required in a shift to fit the order. Where the primary block is not a candidate, extra time is computed by relocating assigned orders earlier or later in time in a portion of the shift, the computation of extra time including computing an amount of time that the portion of the shift can be relocated by aggregating a number of virtual free time blocks in the portion of the shift. Claim 22 recites a computer-readable medium having instructions for a method for finding an opening to fit an order in a schedule that is similar to the method recited in claim 4, including computing extra time by relocating assigned orders earlier or later in time in a portion of the shift, the computation of extra time including computing an amount of time that the portion of the shift can be relocated by aggregating a number of virtual free time blocks in the portion of the shift.

In one embodiment, virtual free time blocks are described as an amount of time that could be used to fit an order by either bumping one or more contiguous orders within a shift or by a free time block. By bumping one or more contiguous orders within a shift, a virtual free time block may accumulate enough free time to fit an order into the shift. *See* paragraph 26 of Patent Publication No. 20010047287 for the present application. In one embodiment, a primary block is described as a block of time into which the order may be inserted. *See* paragraph 37. However, for a primary block that does not have adequate time to fit an order, expansion blocks and load blocks may be used to find extra time that can increase the time of a primary block to fit the order. Id. A primary block is considered a candidate if the duration of the primary block, excluding breaks, is greater than or equal to the amount of free time required in the shift to fit the order. *See* paragraph 39. If a primary block is examined and is not a candidate, a process of computing extra time is performed by shuffling orders that have been already assigned to determine if enough extra time can be added to the primary block to fit an unassigned order. *See* paragraph 40. The process includes aggregating virtual free time blocks in order to provide sufficient extra time to accommodate the order. *See* paragraphs 41-44.

The Examiner has cited col. 22, lines 51-54 of the Lesaint patent as disclosing "computing an amount of time that the portion of the shift can be relocated, including

aggregating a number of virtual free time blocks in the portion of the shift." *See* the Office Action, pages 8-9. More specifically, the Examiner argues that the description of the "task will not be scheduled to a position where the technician would arrive outside the start time plus an allowed margin" found in the cited material is analogous. *Id.* This, however, mischaracterizes the material cited in the Lesaint patent.

The paragraph at col. 22, lines 40-60 describes a portion of an optimization process related to modifying an existing task that has an appointment time. The optimization process takes an already scheduled task that has an appointment time and modifies its time throughout the shift to the extent the appointment time constraints allow to determine if a better "score" can be obtained by scheduling the task at different times. The material cited by the Examiner indicates that a task having an appointment time will not be considered for a time slot during a shift that schedules the arrival of the technician prior to the beginning of the appointment time. The paragraph concludes by explaining that allowing the scheduling of a task prior to the beginning of the appointment time could result in the undesirable situation where a technician incurs idle time. None of the material cited by the Examiner at col. 22, lines 51-54 discusses or is related to computing extra time by relocating assigned orders earlier or later in time by computing an amount of time that the portion of the shift can be relocated and by aggregating a number of virtual free time blocks in the portion of the shift. As previously discussed, the material generally describes that the optimization process includes moving around an existing appointment in a shift to the extent appointment time constraints allow.

The Babayev patent has been cited as disclosing "if the customer preferred time interval cannot be accommodated, then an alternative appointment time may be provided, relatively close to the preferred time interval." *See* the Office Action, page 7. The Examiner argues that this discloses "presenting to a customer at least one option of fitting the order in the schedule to perform a desired service." *See* the Office Action, pages 6-7. Even if it is assumed for the sake of argument that the Examiner's characterization of the Babayev patent is accurate, it does not make up for the deficiencies of the Lesaint patent, as previously described.

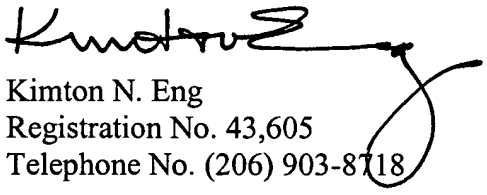
For the foregoing reasons, claims 4 and 22 are patentable over the Lesaint patent in view of the Babayev patent. Claims 5-10, 12, and 14-19, which depend from claim 4, and claims 23-28, 30, and 32-37, which depend from claim 22, are similarly patentable based on their

dependency from a respective allowable base claim. That is, each of the dependent claims further narrows the scope of the claim from which it depends, and consequently, if a claim is dependent from an allowable base claim, the dependent claim is also allowable. Therefore, the rejection of claims 4-10, 12, 14-19, 22-28, 30, and 32-37 under 35 U.S.C. 103(a) should be withdrawn.

All of the claims pending in the present application are in condition for allowance. Favorable consideration and a timely Notice of Allowance are earnestly solicited.

Respectfully submitted,

DORSEY & WHITNEY LLP



Kimton N. Eng
Registration No. 43,605
Telephone No. (206) 903-8718

KNE:ajs

Enclosures:
Postcard
Check
Fee Transmittal Sheet (+ copy)

DORSEY & WHITNEY LLP
1420 Fifth Avenue, Suite 3400
Seattle, WA 98101-4010
(206) 903-8800 (telephone)
(206) 903-8820 (fax)

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